NOAA, NATIONAL WEATHER SERVICE, WEATHER FORECAST OFFICE

Miami, Florida 33165

http://weather.gov/southflorida

Cool and Wet Winter Pattern Continued in March

Coldest March on Record in Naples; Second Coldest in West Palm Beach

April 1, 2010: The near-persistent pattern of cooler than normal temperatures over south Florida since the beginning of the year continued in March. A key contributor to the below normal temperatures was the persistence of a mid/upper level trough over eastern North America and a mid/upper level ridge over western North America which has been the dominant pattern so far this year (Figure 1). This pattern favors frequent cold air intrusions deep into the southern U.S., including Florida. March was also wetter than normal due in large part to the El Niño pattern which favors increased "storminess" over the southern United States, including Florida.

Temperatures

March temperatures over south Florida averaged between 4 and 6 degrees below normal. The coldest period was during the first week of the month when modified arctic air invaded the region and produced record lows and freezing temperatures to parts of south Florida. Other cold air masses affected the area in March, resulting in only a handful of days when temperatures were above normal. Some temperature statistics of note include:

- Naples registered its coldest March on record with an average temperature of 63.6 degrees, breaking the previous record of 64.3 set in 1969. A contributing factor to the record-breaking cold in Naples was the colder than normal Gulf waters which kept maximum temperatures much lower than normal. The average March high temperature in Naples was 71.9 degrees which is 7.5 degrees below the normal March high of 79.4 degrees.

- West Palm Beach had its 2nd coldest March on record with an average temperature of 64.1 degrees. The record is 63.7 set back in 1915.

- Miami Beach registered its coldest March on record with an average temperature of 65.1 degrees, breaking the previous record of 67.1 set in 1968 and 1969 (**see note below temperature table for caveat**).

- Moore Haven had its 3rd coldest March on record with an average temperature of 62.1. Only 1931 and 1969 had colder March readings.

Totaling the average temperatures from January through March 2010, **Naples, West Palm Beach and Miami Beach set all-time recorded lowest temperatures for the three-month period**, Moor e Haven recorded its 2nd coldest January-March, Fort Lauderdale its 4th coldest, and Miami its 9th coldest January-March on record.

Here are average March 2010 temperatures, departure from normal and ranking for select locations:

Location (beginning of period of historical record)	**March 2010 Avg Temp**	**Departure From Normal**	**Rank**
Miami (1895)	67.7	-4.7	12th coldest
Fort Lauderdale (1912)	66.5	-4.6	7th coldest
West Palm Beach (1888)	64.1	-6.5	2nd coldest (1915)
Naples (1942)	63.6	-5.1	Coldest on record
Miami Beach (1927) **	65.1	-5.8	Coldest on record
Moore Haven (1918)	62.1	-5.8	3rd coldest (1931 and 1969)

**** Present Miami Beach temperature data may not be totally comparable to historical data due to difference in time of daily reports which causes double-reporting of low temperatures.**

Following are January -March 2010 average temperatures, departure from normal and ranking for selected locations:

Location (beginning of period of historical record)	**Jan-Mar 2010 Avg Temp (F)**	**Departure From Normal**	**Rank**
Miami (1895)	65.5	-4.4	9th coldest
Fort Lauderdale (1912)	64.4	-4.5	4th Coldest
West Palm Beach (1888)	61.9	-6.1	Coldest on record
Naples (1942)	61.3	-4.7	Coldest on record
Miami Beach (1927) **	63.0	-6.0	Coldest on record
Moore Haven (1918)	59.1	-5.7	2nd coldest (1958)

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Precipitation and Severe Weather

March was a wet month over most of south Florida, as the area was affected by several storm systems which brought heavy rainfall, flooding and gusty winds. In addition, the frontal system that moved through south Florida on March 29th produced a tornado in Oakland Park, along with very heavy rainfall and localized flooding.

March rainfall totals ranged from 3 to 7 inches above normal north of a Naples to Lake Worth line, including the entire Lake Okeechobee region, and generally 1 to 3 inches above normal elsewhere, except central and southern Miami-Dade and Mainland Monroe counties which were near normal (Figure 2). Areas from West Palm Beach across Lake Okeechobee to Glades and Hendry counties recorded anywhere from 7 to almost 11 inches of rain for the month, contributing to a sharp rise in the Lake Okeechobee level during March. Most of the rain in these areas fell late on March 11th and early on March 12th in association with a stalled frontal system over south central Florida, and again on March 28th in Glades and Hendry counties ahead of the strong cold front which triggered the tornado in Broward County on the 29th.

This increased storminess can be tied to atmospheric energy and instability caused by a strong subtropical jet stream over the Gulf of Mexico and southern United States, a pattern typical of strong El Niño winters.

Here are March 2010 rainfall totals, departure from normal and ranking for select locations:

Location (beginning of period of historical record)	March 2010 Rainfall (inches)	Departure From Normal	Rank
Miami (1855)	2.81	+0.25	
Fort Lauderdale (1912)	3.08	+0.28	
West Palm Beach (1888)	10.83	+7.15	5th wettest
Naples (1942)	2.84	+0.76	
Miami Beach (1927)	4.03	+1.83	9th wettest
Moore Haven (1918)	5.06	+2.13	
Devils Garden (1957)	9.10	+5.90	3rd wettest
LaBelle (1929)	8.60	+5.71	4th wettest
Canal Point (1941)	7.05	+3.61	7th wettest
Clewiston (1948)	6.60	+3.92	
Hollywood (1963)	5.17	+3.01	
The Redland (1942)	3.03	+0.58	

Following are January -March 2010 rainfall totals, departure from normal and ranking for selected locations:

Location (beginning of period of historical record)	Jan-Mar 2010 Rainfall (inches)	Departure From Normal	Rank
Miami (1855)	8.39	+1.88	27th wettest
Fort Lauderdale (1912)	8.29	-0.15	
West Palm Beach (1888)	17.25	+7.27	8th wettest
Naples (1942)	5.55	-0.71	
Miami Beach (1927)	10.26	+3.48	7th wettest
Moore Haven (1918)	8.65	+1.63	23rd wettest
Hollywood (1963)	15.25	+7.43	
LaBelle (1929)	11.45	+4.09	
The Redland (1942)	10.64	+3.64	
Clewiston (1948)	9.82	+2.75	

Outlook for April-May

The Climate Prediction Center's outlook for April calls for an increased likelihood of below normal temperatures, continuing the persistent El Niño pattern of the past 3 months. Another factor contributing to below normal temperatures is the cooler than normal water temperatures off the Florida coasts which serve to modify temperatures in onshore flow patterns. It should be noted, however, that El Niño conditions typically wane in April. Therefore, the indicated trends for cooler than normal temperatures in the spring are not as strong as during the winter months. The precipitation outlook for April indicates equal chances of above or below normal rainfall. This suggests that a more typical dry pattern may be in store for south Florida to finish the dry season, significantly increasing the wildfire threat across south Florida as days get warmer and soils dry out faster.

Another common threat in April is rip currents. Onshore easterly flow becomes more prevalent along the Atlantic coast in April, increasing the risk of dangerous and sometimes deadly rip currents.

The May outlook is for an increased likelihood of above normal precipitation and near to slightly below normal temperatures. This outlook is more uncertain than normal due to the continued decreasing effects of El Niño. Long-range models suggest that the current El Niño will weaken significantly by May and dissipate to neutral conditions this summer.

For the latest south Florida weather information, including the latest watches, advisories and warnings, please visit the National Weather Service Miami Forecast Office's web site at weather.gov/southflorida.

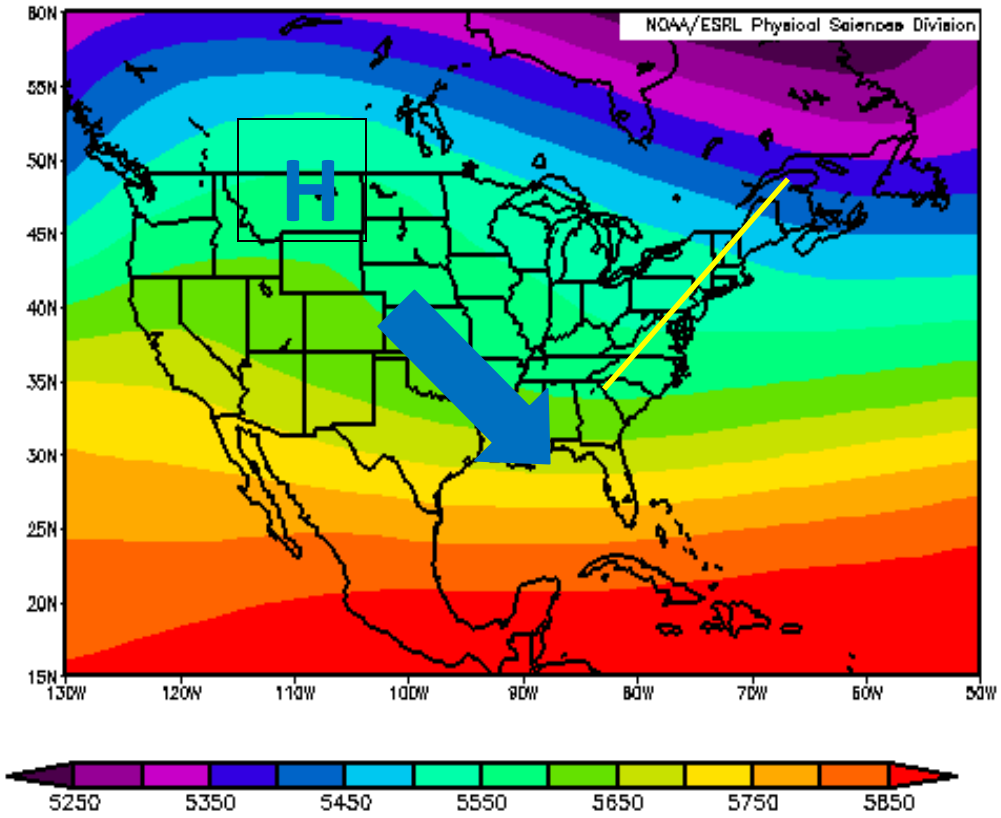

Figure 1: Mean 500 mb (mid atmospheric) pattern during March 2010. High pressure ridge over western U.S. (denoted by H) and trough over eastern Canada and eastern United States (denoted by yellow line) produced mean northwest flow over much of the eastern half of the country (blue arrow).

(Figure 2 below)

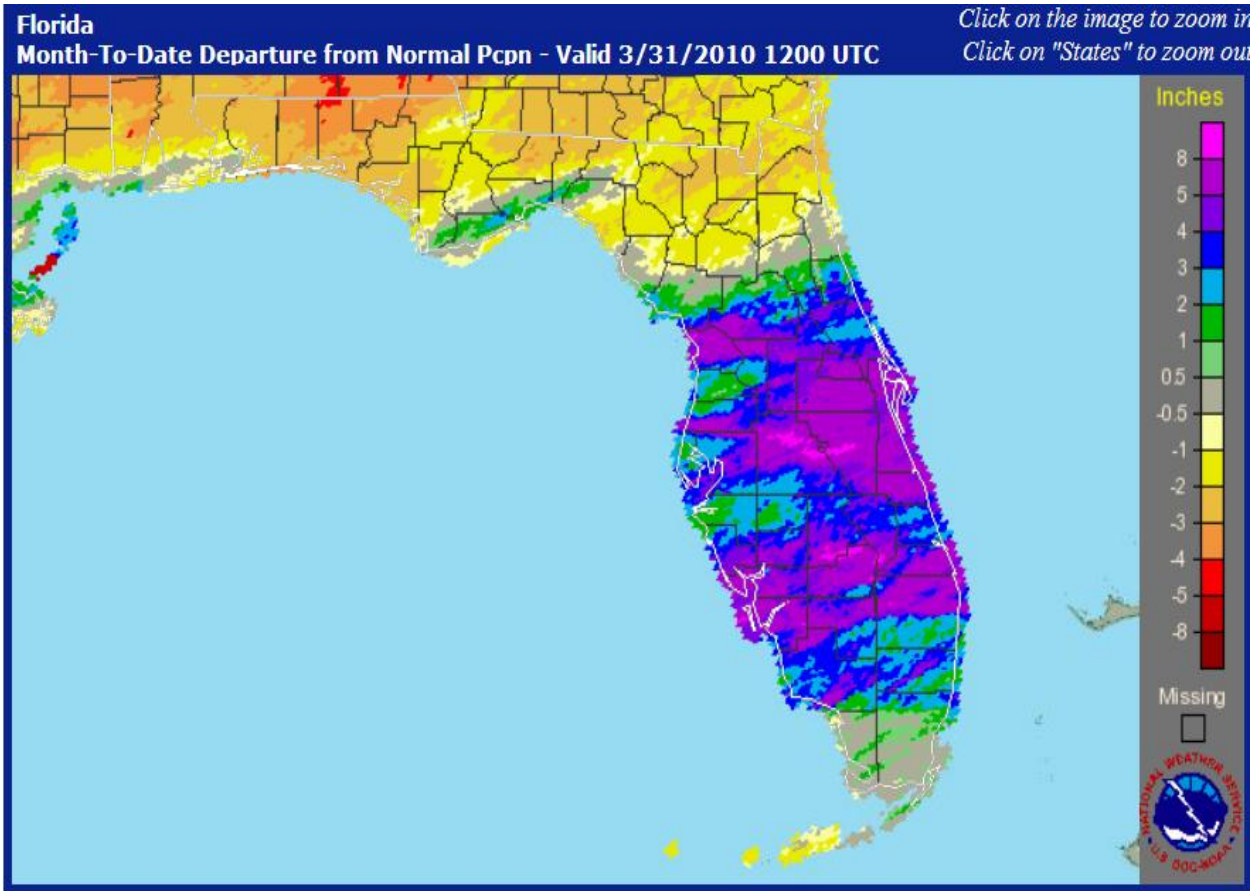

Figure 2: Rainfall departure from normal for March 2010. Blue and purple colors denote areas of 3 to 7 inches above normal. Light blue and green areas reflect values of 1 to 3 inches above normal. Gray denotes areas of near normal rainfall.